

Pterodaustro

Pterodaustro is a genus of Cretaceous pterodactyloid pterosaur from South America, which lived 105 million years ago.

Contents

- [Discovery and naming](#)
- [Description](#)
- [Paleobiology](#)
- [Phylogeny](#)
- [See also](#)
- [References](#)
- [External links](#)

Discovery and naming



Fossil cast, Muséum national d'Histoire naturelle, Paris

The first fossils, among them the holotype PLV 2571, a thigh bone, were in the late sixties discovered by Bonaparte in the Lagarcito Formation, situated in the San Luis Province of Argentina, and dating from the Albian. The genus has later also been found in Chile in the Santa Ana Formation. At the Argentine site, the just 50 square metres (540 sq ft) large "Loma del Pterodaustro", since then during several expeditions over 750 *Pterodaustro* specimens have been collected, 288 of them having been catalogued until 2008. This makes the species one of the best known pterosaurs, with examples from all growth stages, from egg to adult.

The genus was named in 1969 by José Bonaparte as an as yet undescribed *nomen nudum*. The first description followed in 1970, making the name valid, the type species being *Pterodaustro guinazui*.^[1] The genus name is derived from Greek *pteron*, "wing" and Latin *auster*, "south (wind)". The elements are combined as a condensed *pteron de austro*, "wing from the south". The specific name honours paleontologist Román Guiñazú. It was emended in 1978 by Peter Wellnhofer into *guinazui*, because diacritical signs such as the tilde are not allowed in species names.

Pterodaustro

Temporal range: Early Cretaceous,

105 Ma

PreЄ Є O S D C P T J K PgN



Cast of a fossil specimen at the Museo Argentino de Ciencias Naturales in Caballito, Buenos Aires, Argentina

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Order:	†Pterosauria
Suborder:	†Pterodactyloidea
Family:	†Ctenochasmatidae
Subfamily:	†Ctenochasmatinae
Tribe:	†Pterodaestrini
Genus:	† <i>Pterodaustro</i> Bonaparte, 1970
Species:	† <i>P. guinazui</i>

Binomial name

†*Pterodaustro guinazui*

Bonaparte, 1970

Description



Restored skull

Pterodaustro has a very elongated skull, up to 29 centimetres long. The portion in front of the eye sockets comprises 85% of skull length. The long snout and lower jaws curve strongly upwards; the tangent at the point of the snout is perpendicular to that of the jaw joint. *Pterodaustro* has about a thousand bristle-like modified teeth in its lower jaws that might have been used to strain crustaceans, plankton, algae, and other small creatures from the water.^[2] These teeth stand for the most part not in separate alveoli but in two long grooves parallel to the edges of the jaw. They have a length of three centimetres and are oval in cross-section, with a width of just 0.2–0.3 millimetres. At first it was suspected these structures were not true teeth at all, but later research established they were built like normal teeth, including enamel, dentine and a pulp. Despite being made of very hard material, they might still have been flexible to some extent due to their extreme length-width ratio, a bend of up to 45° being possible.^[3] The upper jaws also carried teeth, but these were very small with a flat conical base and a spatula-formed crown. These teeth also do not have separate tooth sockets but were apparently held by ligaments in a special tooth pad, that was also covered with small ossicles, or bone plates.

The back of the skull was also rather elongated and in a low position; there are some indications for a low parietal crest.

Pterodaustro had an adult wingspan of approximately 250 centimetres (8.20 ft).^[4] Its hindlimbs are rather robust and its feet large. Its tail is uniquely elongated for a pterodactyloid, containing 22 caudal vertebrae, whereas other members of this group have at most sixteen.

Paleobiology

Pterodaustro probably strained food with its tooth comb, a method called "filter feeding", also practised by modern flamingos.^[5] Once it caught its food, *Pterodaustro* probably mashed it with the small, globular teeth present in its upper jaw. Like other ctenochasmatoids, *Pterodaustro* has a long torso and proportionally massive and splayed hindfeet, adaptations for swimming.^[6]

Robert Bakker suggested that, like flamingos, this pterosaur's diet may have resulted in a pink hue.^[7]

At least two specimens of *Pterodaustro* have been found, MIC V263 and MIC V243, with gizzard stones in the stomach cavity, the first ever reported for any pterosaur. These clusters of small stones with angled edges support the idea that *Pterodaustro* ate mainly small, hard-shelled aquatic crustaceans using filter-feeding. Such invertebrates are abundant in the sediment of the fossil site.^[8]

A study of the growth stages of *Pterodaustro* concluded that juveniles grew relatively fast in their first two years, attaining about half of the adult size. Then they reached sexual maturity, growing at a slower rate for four to five years until there was a determinate growth stop.^[9]



Life restoration

In 2004 a *Pterodaustro* embryo in an egg was reported, specimen MHIN-UNSL-GEO-V246. The egg was elongated, six centimetres long and 22 millimetres across and its mainly flexible shell was covered with a thin layer, 0.3 mm thick, of calcite.^[10] Three-dimensionally preserved eggs were reported in 2014.^[11]

Comparisons between the scleral rings of *Pterodaustro* and modern birds and reptiles suggest that it may have been nocturnal and similar in activity patterns to modern anseriform birds that feed at night.^[12]

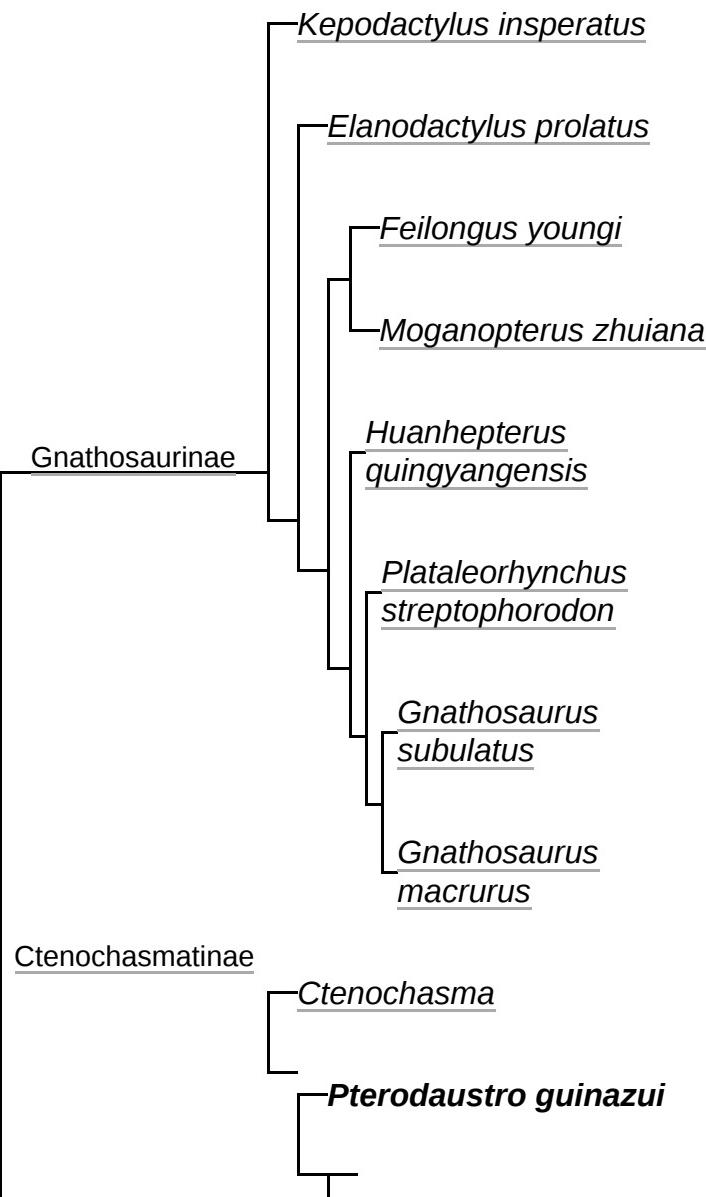
Because of its long torso and neck and comparatively short legs, *Pterodaustro* was unique among pterosaurs in having difficulties to launch. Even with the pterosaurian quadrupedal launching mechanism, it would have required frantic and fairly-low angled take-offs possible only in open areas, much like modern geese and swans.^[6]

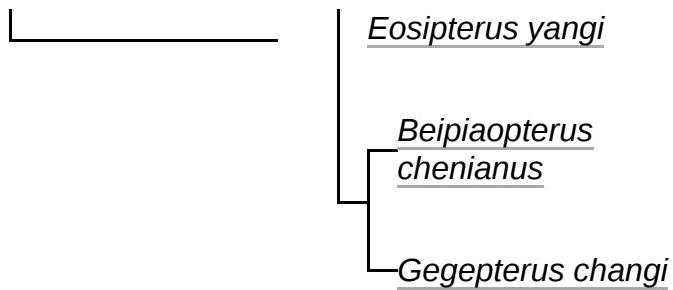
Phylogeny

Bonaparte in 1970 assigned *Pterodaustro* to the Pterodactylidae; in 1971 to a Pterodaustriidae. However, from 1996 cladistic studies by Alexander Kellner and David Unwin have shown a position within the family Ctenochasmatidae, together with other filter feeders.^[6]

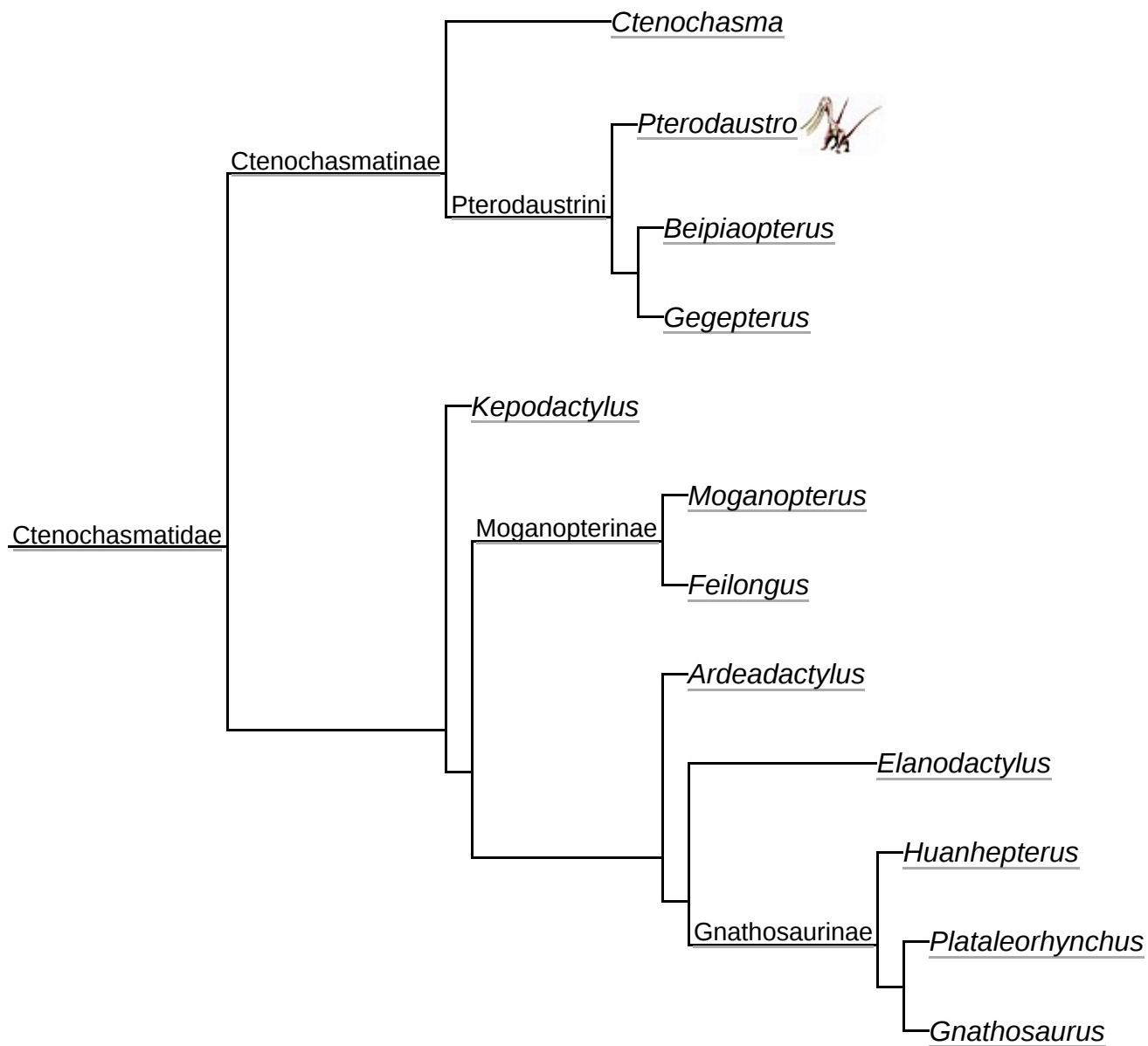
Cladogram following Andres, Clark & Xu, 2014.^[13]

Ctenochasmatidae





In 2018, Longrich, Martill, and Andres recovered a slightly different set of relationships for early pterodactyloids in their own analysis, they recovered *Pterodaustro* within a tribe called Pterodaestrini, though still within the subfamily Ctenochasmatinae.^[14]



See also

- [List of pterosaur genera](#)
- [Timeline of pterosaur research](#)

References

1. Bonaparte, J. F. (1970). "Pterodaustro guinazui gen. et sp. nov. Pterosaurio de la Formacion Lagarcito, Provincia de San Luis, Argentina y su significado en la geologia regional (Pterodactylidae)". *Acta Geologica Lilloana*. **10**: 209–225.
2. Wellnhofer, Peter (1996) [1991]. *The Illustrated Encyclopedia of Pterosaurs*. New York: Barnes and Noble Books. p. 132. [ISBN 0-7607-0154-7](#).
3. John D. Currey (1999). "The design of mineralised hard tissues for their mechanical functions". *Journal of Experimental Biology*. **202** (23): 3285–3294. [PMID 10562511](#) (<https://pubmed.ncbi.nlm.nih.gov/10562511>).
4. Mark P. Witton (2013), *Pterosaurs: Natural History, Evolution, Anatomy*
5. Palmer, D., ed. (1999). *The Marshall Illustrated Encyclopedia of Dinosaurs and Prehistoric Animals*. London: Marshall Editions. p. 104. [ISBN 1-84028-152-9](#).
6. Witton, Mark P. (2013). *Pterosaurs: Natural History, Evolution, Anatomy*. Princeton University Press. [ISBN 0691150613](#).
7. Jinny Johnson (2000). *Fantastic Facts About Dinosaurs* (<https://archive.org/details/fantasticfact>). Parragon Book Service. [ISBN 978-0-7525-3166-3](#).
8. Codorniú, L., Chiappe, L.M., Arcucci, A., and Ortiz-Suarez, A. (2009). "First occurrence of gastroliths in Pterosauria (Early Cretaceous, Argentina)". *XXIV Jornadas Argentinas de Paleontología de Vertebrados*
9. Chinsamy, A., Codorniú, L., and Chiappe, L. M. (2008). "Developmental growth patterns of the filter-feeder pterosaur, *Pterodaustro guinazui*" (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2610039>). *Biology Letters*. **4** (3): 282–285. [doi:10.1098/rsbl.2008.0004](#) (<https://doi.org/10.1098%2Frbl.2008.0004>). PMC 2610039 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2610039>). [PMID 18308672](#) (<https://pubmed.ncbi.nlm.nih.gov/18308672>).
10. Chiappe, L. M., Codorniú, L., Grellet-Tinner, G. and Rivarola, D. (2004). "Argentinian unhatched pterosaur fossil". *Nature*. **432** (7017): 571–572. [Bibcode:2004Natur.432..571C](#) (<https://ui.adsabs.harvard.edu/abs/2004Natur.432..571C>). [doi:10.1038/432571a](#) (<https://doi.org/10.1038%2F432571a>). [PMID 15577899](#) (<https://pubmed.ncbi.nlm.nih.gov/15577899>).
11. Grellet-Tinner, G.; Thompson, M.; Fiorelli, L. E.; Argañaraz, E. S.; Codorniú, L.; Hechenleitner, E. M. N. (2014). "The first pterosaur 3-D egg: Implications for *Pterodaustro guinazui* nesting strategies, an Albian filter feeder pterosaur from central Argentina" (<https://doi.org/10.1016/j.gsf.2014.05.002>). *Geoscience Frontiers*. **5** (6): 759. [doi:10.1016/j.gsf.2014.05.002](#) (<https://doi.org/10.1016%2Fj.gsf.2014.05.002>).
12. Schmitz, L.; Motani, R. (2011). "Nocturnality in dinosaurs inferred from scleral ring and orbit morphology". *Science*. **332** (6030): 705–708. [Bibcode:2011Sci...332..705S](#) (<https://ui.adsabs.harvard.edu/abs/2011Sci...332..705S>). [doi:10.1126/science.1200043](#) (<https://doi.org/10.1126%2Fscience.1200043>). [PMID 21493820](#) (<https://pubmed.ncbi.nlm.nih.gov/21493820>).
13. Andres, B.; Clark, J.; Xu, X. (2014). "The Earliest Pterodactyloid and the Origin of the Group" (<https://doi.org/10.1016/j.cub.2014.03.030>). *Current Biology*. **24** (9): 1011. [doi:10.1016/j.cub.2014.03.030](#) (<https://doi.org/10.1016%2Fj.cub.2014.03.030>). [PMID 24768054](#) (<https://pubmed.ncbi.nlm.nih.gov/24768054>).
14. Longrich, N.R., Martill, D.M., and Andres, B. (2018). Late Maastrichtian pterosaurs from North Africa and mass extinction of Pterosauria at the Cretaceous-Paleogene boundary. (<http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.2001663>) *PLoS Biology*, **16**(3): e2001663. [doi:10.1371/journal.pbio.2001663](#) (<https://doi.org/10.1371%2Fjournal.pbio.2001663>).

External links

- [Giants of the Mesozoic: Pterodaustro](https://web.archive.org/web/20051017082111/http://www.fernbank.edu/museum/giants/Pterodaustro.html) (<https://web.archive.org/web/20051017082111/http://www.fernbank.edu/museum/giants/Pterodaustro.html>)
-

Retrieved from "<https://en.wikipedia.org/w/index.php?title=Pterodaustro&oldid=969641779>"

This page was last edited on 26 July 2020, at 17:12 (UTC).

Text is available under the [Creative Commons Attribution-ShareAlike License](#); additional terms may apply. By using this site, you agree to the [Terms of Use](#) and [Privacy Policy](#). Wikipedia® is a registered trademark of the [Wikimedia Foundation, Inc.](#), a non-profit organization.